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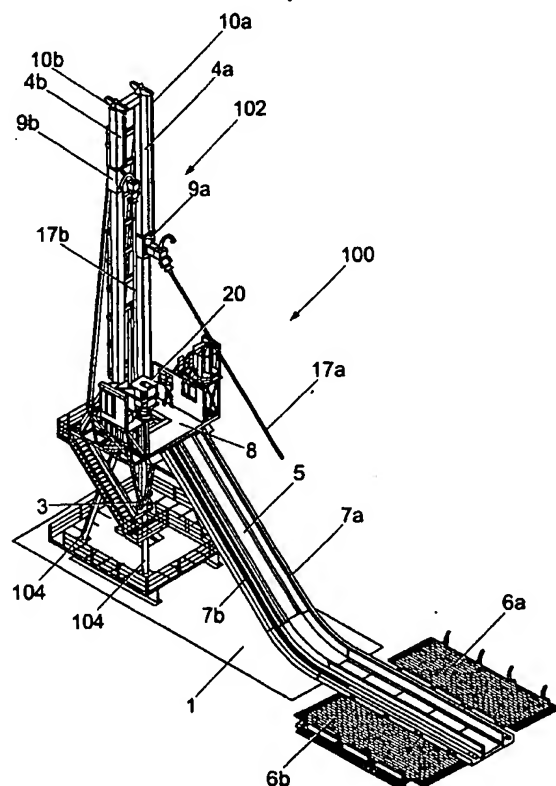
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[Continued on next page]

(54) Title: APPARATUS AND METHOD RELATING TO TONGS, CONTINUOUS CIRCULATION AND TO SAFETY SLIPS



(57) Abstract: Apparatus for inserting or removing a string of tubular from a borehole includes upper and lower closed head power tongs to make up/break out connections with the lower tong as rotary back-up. It also includes a continuous circulation system to keep fluid circulating during tripping operations and a safety slip to prevent tubulars slipping therein comprising two arrangements of grips which are coupled to one another.

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**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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7 February 2002

# INTERNATIONAL SEARCH REPORT

International Application No  
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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B19/16 E21B3/04 E21B19/20 E21B19/15 E21B19/10  
E21B21/00 E21B21/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 34089 A (BAKKER THOMAS WALBURGIS ;WELL ENGINEERING PARTNERS B V (NL); WECHER) 8 July 1999 (1999-07-08) page 3, line 3 -page 4, line 5; figures 1,6 page 5, line 20 -page 8, line 2 ---	1-3,5-8
X	US 1 386 908 A (HENRY TAYLOR WILLIAM) 9 August 1921 (1921-08-09) page 1, line 108 -page 2, line 19; figure 2 ---	1-3,7,8
A	US 4 938 109 A (TORRES CARLOS A ET AL) 3 July 1990 (1990-07-03) column 6, line 40 - line 45; figure 2 --- -/--	1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 01/00781

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	WO 01 03889 A (BANGERT DANIEL S) 18 January 2001 (2001-01-18) page 5, line 13 - line 25; figure 1 ---	1
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A	US 5 746 276 A (STUART RANDOLPH L) 5 May 1998 (1998-05-05) column 2, line 8 - line 34; figure 1 column 5, line 26 - line 28 ---	1
A	US 4 450 906 A (FIRMIN DANIEL) 29 May 1984 (1984-05-29) column 7, line 56 - line 60; figure 1 ---	1
X	WO 98 16716 A (AYLING JOHN LAURENCE) 23 April 1998 (1998-04-23) page 7, line 10 - line 17; figures 1,7 page 11, line 17 - line 24; claims 9,10 ---	9-24
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P,X	WO 00 23686 A (BAKKER THOMAS WALBURGIS ;WELL ENGINEERING PARTNERS B V (NL); KOCH) 27 April 2000 (2000-04-27) Abstract claim 1; figure 1 ---	9-24
P,X	WO 00 79092 A (SHELL CANADA LTD ;SHELL INT RESEARCH (NL)) 28 December 2000 (2000-12-28) page 3, line 21 -page 5, line 33; figure 1 ---	9-24
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## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 499 919 A (FORESTER BUFORD G) 19 February 1985 (1985-02-19) column 1, line 35 - line 41; figures 1,2 column 2, line 4 - line 26; claim 1 ---	25-29
X	US 2 214 194 A (FRANKLEY LAWRENCE W) 10 September 1940 (1940-09-10) page 1, column 1, line 1 - line 17; figures 1,2 page 2, column 1, line 1 - line 48 ---	25-29
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X	US 5 992 801 A (TORRES CARLOS A) 30 November 1999 (1999-11-30) Abstract figure 2 ---	30-37
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# INTERNATIONAL SEARCH REPORT

I. International application No.  
PCT/GB 01/00781

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-8

A tong apparatus comprising upper and lower tong to make up/break out a tubular connection

2. Claims: 9-22

Apparatus and method to circulate fluid through a tubular string

3. Claims: 23-24

Upper and lower seal device to provide a seal with a tubular to be made up in to or broken out from a tubular string

4. Claims: 25-29

A valve mechanism to seal between two tubulars

5. Claims: 30-37

Apparatus to prevent one tubular slipping therein

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/00781

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